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(Continued)

References Cited

(54) SUPPORT STRUCTURES FOR AN ATTACHABLE, TWO-DIMENSIONAL FLEXIBLE ELECTRONIC DEVICE

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(56)

U.S. PATENT DOCUMENTS

4,834,376 A 5/1989 Steinberg 5,065,376 A 11/1991 Choulat (Continued)

FOREIGN PATENT DOCUMENTS

CN 101180669 A 5/2008 CN 101180864 A 5/2008 (Continued)

OTHER PUBLICATIONS

"3M Flexible Transparent Touchscreen Concepts" video located on the Internet at http://www.youtube.com/watch?v=kCZz4jFok_o (uploaded Jan. 6, 2011).

(Continued)

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(57) ABSTRACT

A dynamically flexible article or device, such as an armband, includes a flexible electronic component, such as a flexible electronic display, and a flexible support structure coupled to the flexible electronic component, wherein the flexible support and the flexible electronic component are flexible along two dimensions to thereby be able to conform to a complex curved surface. The flexible support includes bending limiting structure that constrains bending of the flexible electronic component to prevent undesirable bending.

18 Claims, 36 Drawing Sheets

